DOCUMENT RESUME

ED 288 283 EC 200 753

AUTHOR Hall, Penelope K.; And Others
TITLE The Presence of Word-Retrieval Deficits in Developmental Verbal Apraxia.
PUB DATE Nov 86
NOTE 22p.; Paper presented at the Annual Convention of the American Speech-Language-Hearing Association (Detroit, MI, November 21-24, 1986).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Articulation Impairments; Communication Skills; Elementary Education; *Expressive Language; *Language Handicaps; *Receptive Language; *Speech Handicaps; Speech Skills; *Verbal Ability; Verbal Tests
IDENTIFIERS *Apraxia (Speech); *Word Retrieval

ABSTRACT

Five children, aged 7-10 years, exhibiting Developmental Verbal Apraxia (DVA) were evaluated to determine the presence of word-retrieval problems. DVA is a symptom cluster including at least some of 21 potential symptoms, such as delayed speech development and severe articulation disorder. The Boston Naming Test (a picture confrontation naming task) and the Peabody Picture Vocabulary Test-Revised, Form L, were administered to all subjects. Evidence of word-finding problems was based on the number of correct responses, the speed with which responses were given, and other word-finding behaviors. Results indicated that the DVA children had more restricted receptive vocabularies, expressively identified fewer pictures correctly upon confrontation, identified the pictures more slowly than did normal children of the same age, and exhibited more behaviors often associated with word-finding problems (such as fidgeting and hitting their heads). A year later, two of the DVA children were administered the new German's Test of Word Finding, which confirmed the continuing presence of word-finding problems. It was concluded that children exhibiting DVA are thus at high risk to exhibit significant word-retrieval problems, and remedial objectives addressing these problems should be included in treatment programs of DVA clients so identified. Appended are tables detailing the research results. (JDD)

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ED288283

Info

THE PRESENCE OF WORD-RETRIEVAL DEFICITS IN DEVELOPMENTAL VERBAL APRAXIA

Penelope K. Hall

Donald A. Robin

Department of Speech Pathology and Audiology

Linda S. Jordan

Departments of Neurology and Speech Pathology and Audiology

University of Iowa

Iowa City, Iowa 52242

Paper presented at the national meetings of the

American Speech-Language-Hearing Association

Detroit, Michigan

November, 1986

EC 200 753

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THE PRESENCE OF WORD-RETRIEVAL DEFICITS IN DEVELOPMENTAL VERBAL APRAXIA

Penelope K. Hall, Donald A. Robin, and Linda S. Jordan

University of Iowa

Children exhibiting Developmental Verbal Apraxia (DVA) are frequently described as presenting a language disorder as well. During clinical work with DVA children the authors of this paper observed that many of the children appeared to present word-retrieval difficulties during expressive language attempts. This observation also was made by Aram and Glasson (1979) who commented that "several" of their eight DVA subjects were "anomic."

The focus of today's paper is to describe our pilot work in probing for the presence, or absence, of word-retrieval problems in this particular population of children.

Method

This study of possible word-finding problems was a pilot performed as a part of a larger project which is investigating a number of questions about the clinical entity of DVA. Our subjects were 5 DVA children and 5 normal children who were sex and age-matched to the DVA subjects.

The criteria for inclusion as a DVA subject are shown on Overhead #1.

1. Normal hearing at the time of testing, and having no history of prolonged loss, or chronic or prolonged ear infections
2. A measured intelligence quotient of 80 or above.
3. A diagnosis of DVA made by two or more members of the clinical faculty or staff at the University of Iowa Speech and Hearing Clinic.

The authors agree with Jaffee (1994) that DVA is a symptom CLUSTER in which no one characteristic or symptom must be present, in which no typically reported symptom is exclusively present, and in which not all symptoms of the cluster must be present. (Overhead # 2.) Review of the clinic records of the five selected subjects revealed clinical descriptions consistent with characteristics used in the literature to describe DVA. These include the presence of:

Delayed/deviant speech development

Severe articulation/phonological disorder

Vowel omissions or misarticulations

Presence of metathetic errors

Difficulty sequencing phonemes

Increase in errors as length or complexity of utterance increases

2 or 3 phoneme features in error

Inconsistent errors

Decreased intelligibility in conversational speech

Groping/silent posturing

Resistance to traditional articulation remediation techniques

Slow response to remediation

Prosodic disturbances

Presence of oral apraxia

Difficulty in performing and sequencing volitional oral movements

Slow, imprecise diadochokinetic rates

Evidence of language problems

Language reception better than expression

Presence of learning disabilities, reading and academic problems

Family history of speech problems, and

"Soft" neurological findings

The DVA subjects were two girls, ages 9-10 and 9-3, and three boys, ages 7-4, 8-11, and 10-3 at the time of testing.

Criteria for inclusion as a normal subject are shown on Overhead # 3.

1. Sex and age-matched to within 6 months of a specific DVA subject. In fact, two pairs of subjects were matched exactly to age, and the remaining three pairs were all matched within two months, with the normals being one or two months younger than their DVA match.
2. Exhibit normal articulation and having no history of articulation or language difficulties
3. Have normal hearing at the time of testing, and no history of chronic or prolonged ear infections or hearing loss
4. Have a measured IQ of 80 or above.

All subjects were administered the Boston Naming Test by Kaplan, Goodglass and Weintraub, 1983, which is a picture confrontation naming task. The test includes specified "stimulus cues" to be used to assure that the subjects do not misperceive the picture. Specified "phonemic cues" also can be provided by the examiner in an attempt to assess whether the stimulus word is in the subject's vocabulary, although responses made after phonemic cues are not included in the total number of correct items. The test has provisional norms for children, although the population on which these norms were based consisted of five children at each of six age levels from 5 1/2 through 10 1/2 years. In the present study, responses were tabulated on-line, as well as transcribed verbatim by the investigators from audio tapes. Response latency times were

calculated from the audio tapes as well. In addition, the revised Peabody Picture Vocabulary Test (Dunn & Dunn, 1981) was administered to all 10 subjects.

We examined our results for evidence of word-finding problems by looking at 1) the number, 2) the speed with which responses were given, and 3) other word-finding behaviors.

Results

Overhead 4 compares the number of correct responses on the Boston Naming Test which were achieved by each subject pair, with the DVA subjects consistently performing more poorly than the normal subjects. When comparing these performances to the mean number correct and to the standard deviations of the provisional norms developed for the test, the normal subjects in this study were within ±1 standard deviation, while the DVA subjects were 3 to 7 standard deviations below the provisional mean.

The speed with which responses were given also was investigated. This was done by a number of methods, such as computing mean response latencies from the time of picture exposure to the production of correct responses when no stimulus or phonemic cues were given, when stimulus cues were included, and when stimulus and phonemic cues both were included. These yielded differences in performances in four of the five subject pairs, with the four DVA children being slower in responding than were the normal children. The remaining subject pair (pair number 1) achieved comparable latencies on these analyses. However, the typical trend was most dramatically evident in all five subject pairs when the mean response latency was computed from the time of picture exposure to the first spontaneous utterance, either correct or incorrect. These differences in mean response latencies are shown by subject pairs on Overhead 5. The mean latency for the entire DVA group was 5.91 seconds,

compared to the mean response latency of 2.49 for the entire normal group. The DVA subjects, individually and as a group, were slower and responded to fewer times than the normal subjects, whether the responses were correct or incorrect.

It is interesting that differences in mean response latencies were most evident between the two subject groups when latencies for first responses, whether correct or incorrect, were calculated. An explanation may be that first spontaneous utterances which are incorrect may be on those items with which the child is having retrieval difficulties since errors increased as the children advanced in the test. Kaplan et al, the test developers, state that the test's vocabulary picture plates are ordered from easiest to most difficult. Butterfield and Butterfield (1977) take a posture that an individual's vocabulary reflects the language that is heard, so frequently mentioned words are the ones developing the greatest likelihood of retrieval and use by the individual. Conversely, less frequently heard words are less likely to be retrieved and used. Our results reflect that children have more problems as they advanced in the test to the items which constituted difficult, and presumably lower frequency, vocabulary items for them. Longer response latencies and more errors are made on these more difficult items, thus better tapping potential word-finding problems than are response latencies based only on correct responses, which may be words more frequently heard and used by the child and thus more easily retrieved.

During administration of the test the examiners noted behavioral components, both verbal and gestural, which were thought to be associated with word-finding problems. The DVAs were observed to use silent latencies and fillers, but rarely verbalized their tip-of-the-tongue experiences, although they confirmed this if questioned. Also noted were gestures such as hitting

their heads or tabletop and fidgeting. These behaviors were exhibited throughout the test administration. The normal group were more verbally overt when they experienced word-retrieval problems: "I remember the name in my head but can't get it out of my mouth." The normals also were noted to use fillers, and occasionally used gestures, particularly as they neared the end of the test with stimulus items having low frequency of occurrence.

The picture confrontation naming task requires production of vocabulary items. Therefore, we assessed the subjects' performance on a vocabulary comprehension task to determine whether poor performance in the confrontation naming task reflected inadequate vocabulary knowledge. The selected measure was the Peabody Picture Vocabulary Test-Revised, Form L, with the results depicted on the bar graph on Overhead 6. The percentile ranks achieved by the DVA subjects were consistently below those of the normal subjects. So, reduced vocabulary size could be a component in the results achieved on the Boston Naming Test.

Results shared in this paper indicated that the DVA children had more restricted receptive vocabularies, expressively identified fewer pictures correctly upon confrontation, identified the pictures more slowly than did normal children of the same age, and exhibited more behaviors often associated with word-finding problems. The DVA children exhibited more difficulties in retrieving specific words under a time constraint than did their matched normals. Word-retrieval problems seemed present in four of the DVA subjects, and possibly with the fifth subject as well.

The data presented in this paper was collected one year ago with the DVAs. Two of the five DVA children have received on-going services through our clinical facility during the intervening year. German's Test of Word Finding which was published earlier this year, was administered to these two subjects.

and confirmed the presence of word-finding problems. These children are subjects 3 and 4 on our overheads. Overhead 7 summarizes TWF results. Both children achieved percentages indicative of good comprehension on the test. Both children also were described as being "slow and inaccurate namers."

Clinical Implications

It is the opinion of the investigators that children exhibiting DVA are at high risk to exhibit clinically significant word-retrieval problems. We caution that this problem is one which must be carefully assessed, with qualitative observations and quantative measures being obtained, although Hall and Jordan (in press) stressed that word-finding problems may elude any single identification technique. It has been our experience that word-finding problems, especially with the DVA client, can be variable from day to day, so assessment might take place over several contact sessions. The speech-language pathologist also should be cautioned to carefully observe behaviors indicative of word-finding difficulties to ascertain these behaviors from the groping and silent posturing behaviors the DVA children also may exhibit. Further, once word-retrieval problems are identified, we urge that remedial objectives which directly address word-finding difficulties be included in the over-all treatment programs of these DVA clients.

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CRITERIA FOR DVA SUBJECTS

NORMAL HEARING

INTELLIGENT QUOTIENT OF 80 OR ABOVE

DIAGNOSIS OF DVA

PRESENCE OF DVA CHARACTERISTICS BY SUBJECT

	S#1	S#2	S#3	S#4	S#5
DELAYED/DEVIANT SPEECH DEVELOPMENT	?	X	X	X	X
SEVERE ARTICULATION/ PHONOLOGICAL DISORDER	X	X	X	X	X
VOWEL OMISSIONS OR MISARTICULATIONS		X	X	X	X
METATHETIC ERRORS	X	X	X	X	X
DIFFICULTY SEQUENCING PHONEMES	X	X	X	X	X
INCREASE IN ERRORS AS LENGTH OR COMPLEXITY OF UTTERANCE INCREASES	X	X	X	X	X
2 OR 3 PHONEME FEATURES IN ERROR	X	X	X	X	X

	S#1	S#2	S#3	S#4	S#5
INCONSISTENT ERRORS	X	X	X	X	X
DECREASED INTELLIGIBILITY IN CONVERSATIONAL SPEECH	X	X	X	X	X
GROPING/SILENT POSTURING	X	X	X	X	X
RESISTANCE TO TRADITIONAL ARTICULATION REMEDIATION		X	X		X
SLOW RESPONSE TO ARTICULATION REMEDIATION	X	X	X	X	X
PROSODIC DISTURBANCES	X	X	X	X	X
PRESENCE OF ORAL APRAXIA	X	X	X	X	X

	S#1	S#2	S#3	S#4	S#5
DIFFICULTY IN PERFORMING AND SEQUENCING VOLITIONAL ORAL MOVEMENTS	X	X	X	X	X
SLOW, IMPRECISE DIADOCHOKINETIC RATES	X	X	X	X	X
EVIDENCE OF LANGUAGE PROBLEMS	X	X	X	X	X
LANGUAGE RECEPTION BETTER THAN EXPRESSION	X	X	X	X	X
PRESENCE OF LEARNING DISABILITIES/ READING/ACADEMIC DIFFICULTIES	X	X	X	X	X
FAMILY HISTORY OF SPEECH PROBLEMS	X	X	X	X	X
"SOFT" NEUROLOGICAL FINDINGS	X	X	X	X	X

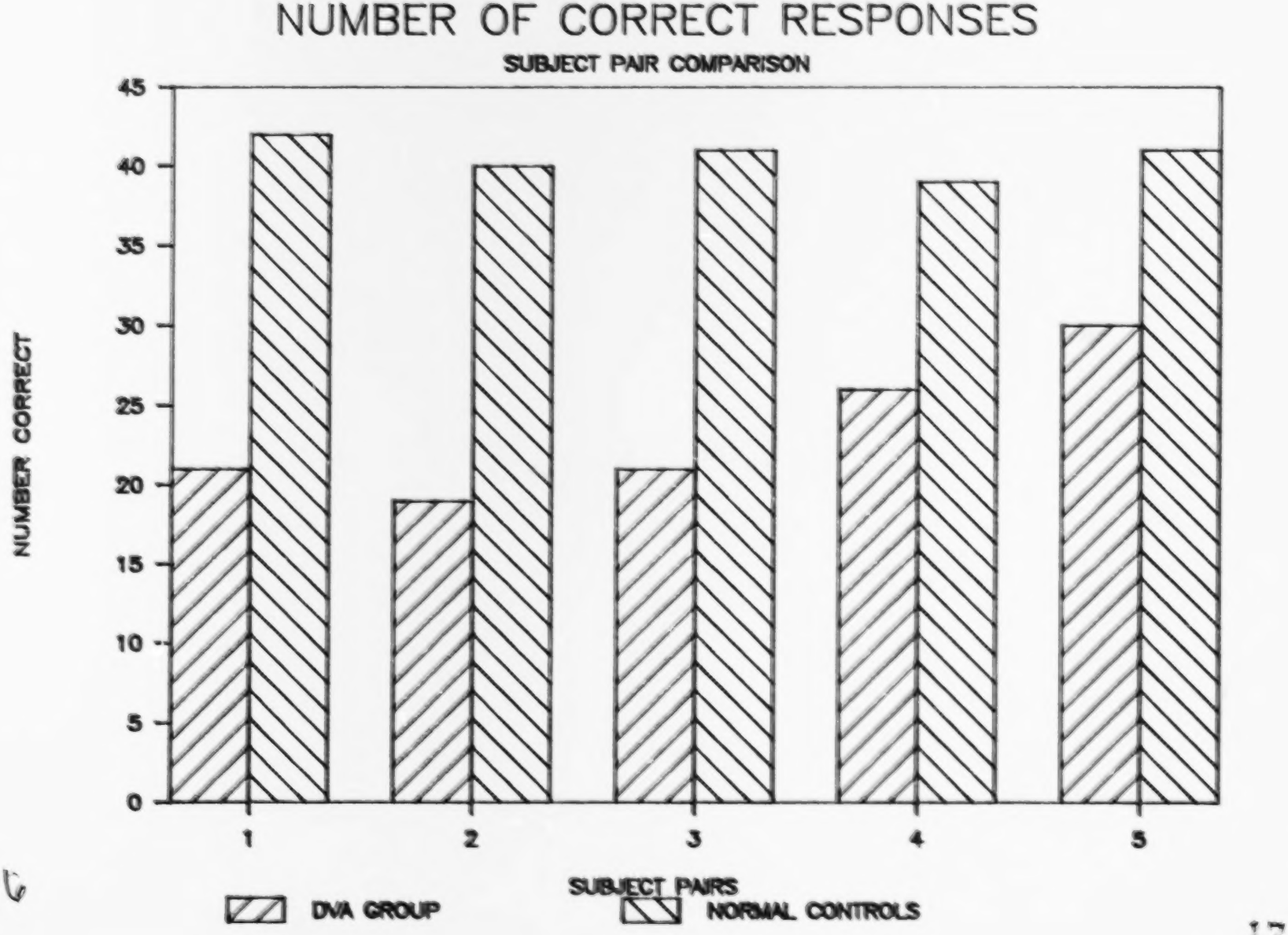
CRITERIA FOR NORMAL SUBJECTS

SEX AND AGE-MATCHED TO WITHIN 6 MONTHS OF A SPECIFIC DVA SUBJECT

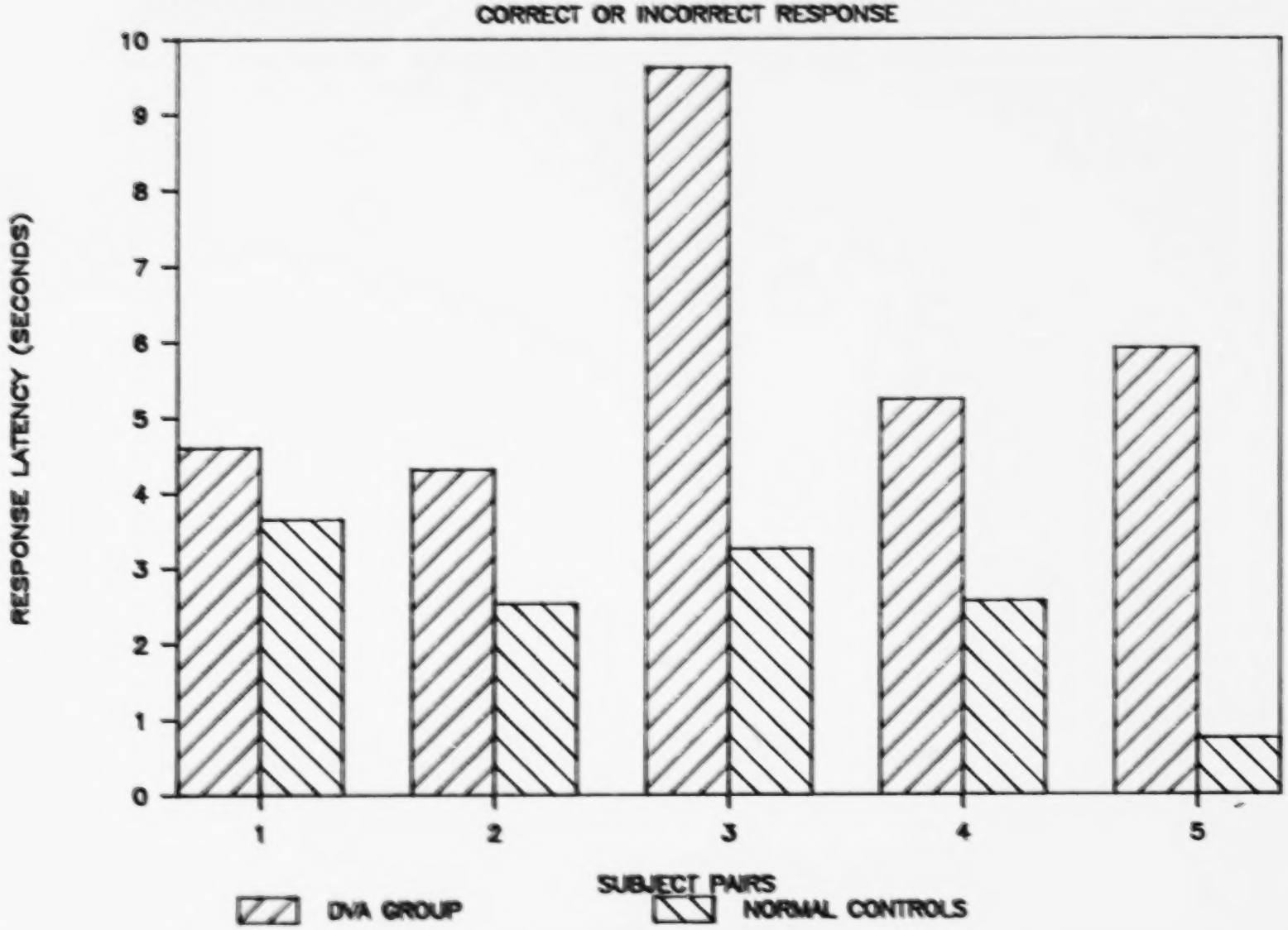
NORMAL ARTICULATION

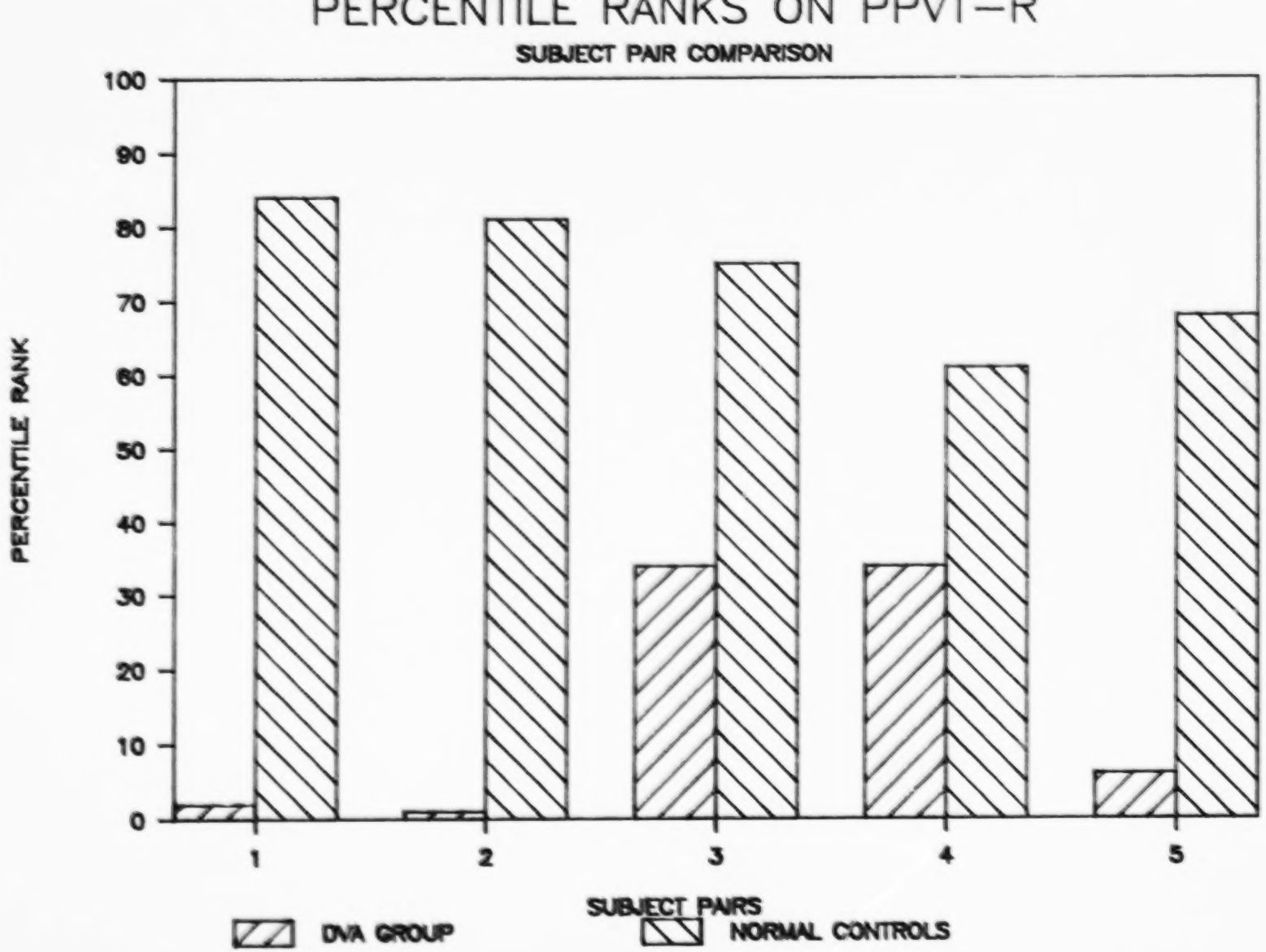
NORMAL HEARING

INTELLIGENCE QUOTIENT OF 80 OR ABOVE


NUMBER OF CORRECT RESPONSES
SUBJECT PAIR COMPARISON
NUMBER CORRECT
45
40
35
30
25
20
15
10
5
0
1
2
3
4
5
SUBJECT PAIRS
DVA GROUP
NORMAL CONTROLS

MEAN RESPONSE LATENCIES OF FIRST SPONT.




PERCENTILE RANKS ON PPVT–R
SUBJECT PAIR COMPARISON
PERCENTILE RANK
100
90
80
70
60
50
40
30
20
10
0
1
2
3
4
5
SUBJECT PAIRS
DVA GROUP
NORMAL CONTROLS

RESULTS ON GERMAN'S TEST OF WORD-FINDING

	SUBJECT 3	SUBJECT 4
PERCENTILE RANK	BELOW 4TH.	4TH. FOR AGE 20TH. FOR GRADE
PERCENT OF COMPREHENSION	95% OR ABOVE	90% OR ABOVE
USE OF GESTURES	20% OF ITEMS	20% OF ITEMS
EXTRA VERBALIZATIONS	29% OF ITEMS	14% OF ITEMS
WORD-FINDING PROFILE	"SLOW AND INACCURATE NAMER"	"SLOW AND INACCURATE NAMER"